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Yoshiaki KUSUNOKI et al.

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For: APPARATUS AND METHOD FOR
PROGRAMMING THE RECORDING OF
BROADCAST PROGRAMS AND DELAYING
THE RECORDING END TIMES WHEN
EXTENSION KEYWORDS ARE DETECTED

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SUBMISSION OF CERTIFIED ENGLISH TRANSLATION

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Sir:

Applicants submit herewith a certified English language translation of Japanese
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CERTIFICATE OF TRANSLATION

I, Kunio KOHMOTO, residing at c/o M-TEC COMPANY LIMITED, Uemura Nissei
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5 declare that I am conversant with the English and Japanese languages and a
competent translator thereof. and I further certify that to the best of my
knowledge and belief the document attached hereto is a true and correct
translation made by me of the document Application No. JP 2004/065228 in
the Japanese language.

10

Signed this 9 day of December, 2009

A handwritten signature in black ink, appearing to read 'Kunio Kohmoto', written over a horizontal line.

Kunio KOHMOTO

15

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5 [Submission Items]

[Item] Claims

[Item] Specifications

[Item] Drawings

[Item] Abstract

[Name of Document] SCOPE OF CLAIMS

[Claim 1]

A video-recording programming apparatus, comprising:

receiving means that receives broadcast programs;

5 recording means that records the broadcast programs received
by the receiving means;

recording programming means that sets the recording start
time and the recording end time of a given program in the broadcast
programs, to program the given program;

10 program information acquisition means that acquires
electronic program-guide information;

extension keyword search means that searches electronic
program-guide information relating to the programmed broadcast
program and for electronic program-guide information relating to a
15 program to be broadcast on the same channel and the same date as
and prior to the programmed broadcast program, for a predetermined
extension keyword indicative of a program extension/delay; and

delay means that delays the recording end time of the
programmed broadcast program, if as a result of a search by the
20 extension keyword search means a broadcast program in which the
extension keyword has been found is present.

[Claim 2]

The video-recording programming apparatus as recited in claim 1,
25 characterized in further comprising an extension time period setting

means that sets an extension time period for a recording end time to be delayed by the delay means.

[Claim 3]

5 The video-recording programming apparatus as recited in any one of claim 1 and claim 2, characterized in that if a broadcast program in which the extension keyword has been found is present, the delay means calculates a total extension time period obtained by multiplying by a predetermined extension time period the number of
10 broadcast programs in which an extension keyword has been found, and then delays the recording end time of the programmed broadcast program by the total extension time period.

[Claim 4]

15 The video-recording programming apparatus as recited in any one of claim 1 through claim 3, characterized in that the extension keyword is a phrase of a predetermined number or more of consecutive characters.

20 [Claim 5]

The video-recording programming apparatus as recited in any one of claim 1 through claim 4, characterized in that the extension keyword is a combination of two or more predetermined non-consecutive phrases, and the spacing between phrases forming the combination
25 falls within a predetermined number of characters.

[Claim 6]

The video-recording programming apparatus as recited in any one of claim 1 through claim 5, characterized in that the electronic program
5 guide information acquired relating to the programmed broadcast program, and the electronic program guide information acquired relating to a program to be broadcast on the same channel and the same date as and prior to the programmed broadcast program, are searched for a predetermined non-extension keyword indicative of no
10 extension/ delay of the program being made, and a program in which the non-extension keyword has been found is not searched for the extension keyword.

[Claim 7]

15 The video-recording programming apparatus as recited in any one of claim 1 through claim 6, characterized in that the extension keyword means searches electronic program guide information acquired relating to the programmed broadcast program and electronic program guide information acquired relating to a program to be
20 broadcast on the same channel and the same date as and prior to the programmed broadcast program, for a genre to which the program belongs, and if a genre found does not coincide with one of predetermined genres, then the extension keyword search means does not search the extension keyword.

25

[Claim 8]

The video-recording programming method of setting the recording start time and the end time, and programming of recording a given program in the broadcast programs, characterized in comprising the
5 steps of:

acquiring electronic program guide information;

searching electronic program guide information acquired relating to the programmed broadcast program, and electronic program guide information acquired relating to a program to be
10 broadcast on the same channel and the same date as and prior to the programmed broadcast program, for a predetermined extension keyword indicative of a broadcast program extension/delay; and

delaying a recording end time of the programmed broadcast program, if as a result of a search in the step of searching the
15 extension keyword a program in which the extension keyword has been found is present.

[Claim 9]

The video-recording programming method as recited in claim 8,
20 further comprising a step of setting an extension time period.

[Claim 10]

The video-recording programming method as recited in any one of claim 8 and claim 9, characterized in that if a program in which the
25 extension keyword has been found is present, in the step of delaying

the recording end time, a total extension time period obtained by multiplying by the predetermined extension time period the number of the broadcast programs in which the extension keyword has been found, is calculated, then the programmed broadcast program
5 recording end time is delayed by only the total extension time period.

[Claim 11]

The video-recording programming method as recited in any one of claim 8 through claim 10, characterized in that the extension
10 keyword includes a phrase greater than/equal to the number of predetermined consecutive characters.

[Claim 12]

The video-recording programming method as recited in any one of
15 claim 8 through claim 11, characterized in that the extension keyword is a combination of two or more non-consecutive phrases, and the spacing between phrases forming the combination falls within a predetermined number of characters.

20 [Claim 13]

The video-recording programming method as recited in any one of claim 8 through claim 12, characterized in that in the step of searching the extension keyword, the electronic program guide information acquired relating to the programmed broadcast program,
25 and the electronic program guide information acquired relating to a

program to be broadcast on the same channel and the same date as
and prior to the programmed broadcast program, are searched for the
predetermined non-extension keyword indicative of the program
being not extended/delayed, and a program in which the non-
5 extension keyword has been found is not searched for the extension
keyword.

[Claim 14]

The video-recording programming method as recited in any one of
10 claim 8 through claim 13, characterized in that in the step of
searching the extension keyword, the electronic program guide
information acquired relating to the programmed broadcast program,
and the electronic program guide information acquired relating to a
program to be broadcast on the same channel and the same date as
15 and prior to the programmed broadcast program, are found for a
genre to which the program belongs, and if the genre found does not
coincide with one of predetermined genres, then a search for the
extension keyword is not performed.

[Specification]

VIDEO-RECORDING PROGRAMMING APPARATUS AND METHOD
THEREFOR

5 [TECHNICAL FIELD]

[0001]

This invention relates to video-recording programming apparatuses and methods for programming and recording programs that are to be broadcast.

10

[BACKGROUND ART]

[0002]

Conventionally, when broadcast programs scheduled to be broadcast are programmed, a user sets up the channel, the start
15 time, and the end time, of a program for a video-recording programming apparatus and the video-recording programming apparatus has recorded the programs in line with the contents of the setting. On the other hand, in real broadcasting (e.g., a sports program such as a professional baseball game), it has occurred that
20 the broadcast time is often extended due to the game situation. As a result, a situation has occurred in which when a program scheduled to be broadcast subsequent to an extended program remains as registered by maintaining the originally scheduled start time and end time thereof on an video-recording programming
25 apparatus, part or the whole of the programmed broadcast program

fails to be recorded due to the extension of the program. Therefore,
it has been proposed (e.g., refer to Patent Document 1) that by
searching electronic program guide information of a programmed
broadcast program or a program scheduled to be broadcast prior to
5 the programmed broadcast program, for a maximum extension time,
the end time of the programmed broadcast program recording is
extended in accordance with, when detected, the maximum extension
time.

[0003]

10 Patent Document 1

Japanese Unexamined Patent Publication No. 2003-134431 (page
10, lines 34 through 43, Figs. 1 and 2)

[DISCLOSURE OF INVENTION]

15 [Problem that the Invention is to Solve]

[0004]

However, information being represented by character codes of
the current electronic program guide information has rarely
described maximum extension times, thus causing failures of
20 extending the recording end time with respect to most programs that
are likely to be extended. As a result, part or the whole of a
program has been incapable of being recorded.

[0005]

This invention has been made to solve the above described
25 problems with conventional art, and an object thereof is to provide

an video-recording programming apparatus and method therefor that prevent an occurrence of failures of part or the whole of programmed broadcast programs by detecting the possibility of extension of a programmed broadcast program and broadcast programs scheduled
5 to be broadcast prior to the programmed broadcast program, and by then delaying, when the program is determined to be extended, the recording end time of the programmed broadcast program.

[Means for Solving the Problem]

[0006]

10 A video-recording programming apparatus according to the present invention comprises receiving means that receives broadcast programs; recording means that records broadcast programs received by the receiving means; recording programming means that sets the recording start time and the recording end time of a given program
15 in the broadcasting programs, to program the given program; broadcast program information acquisition means that acquires electronic program-guide information; extension keyword search means that searches the electronic program-guide information acquired relating to a program to be broadcast on the same channel
20 and the same date as and prior to the programmed broadcast program, for predetermined extension keywords indicative of a program extension or delay; and, delay means that delays the recording end time of the programmed broadcast program, if as a result of a search by the extension keyword search means, broadcast
25 programs in which the extension keyword is detected are present.

[0007]

Moreover, a video-recording programming method according to the present invention, being a video-recording programming method of setting in order to receive and record broadcast programs, the recording start time and the recording end time of a given program in the broadcast programs, to program the given program, includes the steps of acquiring electronic program guide information; searching the electronic program guide information acquired relating to a program to be broadcast on the same channel and the same date as and prior to the programmed broadcast program, for predetermined extension keywords indicative of a program extension or delay; and delaying the recording end time of the programmed broadcast program, if, as a result of a search in the extension keyword search step, the extension keyword is present.

[Effects of the Invention]

[0008]

In a video-recording programming apparatus or method according to the present invention, electronic program guide information acquired relating to programmed broadcast programs, and electronic program guide information acquired relating to broadcast programs scheduled to be broadcast on the same channel and the same date as and prior to the programmed broadcast program, are searched for a predetermined extension keyword indicative of program extension or delay, since, when a broadcast program is present in which an extension keyword is detected, the

recording end time of a programmed broadcast program is delayed,
even though a programmed broadcast program, and a program
scheduled to be broadcast prior to the programmed broadcast
program, each on the same channel, are extended on their real
5 broadcasting, there are effects in that a situation where part or the
whole of the programmed broadcast program fails to be recorded can
be avoided.

BEST MODE FOR CARRYING OUT OF INVENTION

10 [0009]

Embodiment 1

Fig. 1 is a block diagram outlining a configuration of a video-
recording programming apparatus according to Embodiment 1 of the
present invention. As shown in Fig. 1, a video-recording
15 programming apparatus 1 includes a TV tuner connected to an
exterior antenna 2, an A/D (analog/digital) converter 6, an MPEG
(motion picture experts group) encoder 7, a recording buffer 8, a
slicer 9 for extracting an EPG (electronic program guide)
information, a CPU 10, an HDD (hard disk drive) controller 11, an
20 HDD 12, a remote control interface 16 for receiving signals from the
remote control 3, and a nonvolatile memory 19. The video-recording
programming apparatus 1 also includes a readout buffer 15, an
MPEG decoder 14, an OSD (on-screen display) 18, a D/A
(digital/analog) converter 17 for outputting into a display monitor 4
25 analog video signals, and a volatile memory 13.

[0010]

In Fig. 1, the TV tuner 5 receives broadcast programs via the antenna 2. The TV tuner 5, having a function of tuning in to a designated channel, outputs tuned channel's video and audio signals to the A/D converter. The A/D converter 6 converts into digital signals, analog video signals and audio signals from the TV tuner 5. The MPEG encoder 7 compresses in an MPEG format digitized video signals, outputting bitstreams that are the compressed data. The HDD 12 stores bitstreams outputted from the MPEG encoder. The HDD controller 11, being a controller for controlling the HDD 12, controls writing and reading operations of the bitstreams. The recording buffer 8 is provided so that while writing bitstreams into the HDD 12, the bitstreams outputted from the MPEG-encoder 7 are capable of being recorded without a lack of bitstreams.

[0011]

The MPEG decoder 14 decodes the bitstreams compressed in the MPEG format to convert into non-compressed digital video signals. The readout buffer 15 avoids occurrence of buffer underflow in decoding by reading and storing in advance bitstreams that the MPEG decoder 14 requires. The OSD 18 is a drawing device for superimposing text and image data onto MPEG-decoded digital image signals. The D/A converter 17 converts digital video signals into analog video signals that the monitoring display 4 can display.

[0012]

The slicer 9 extracts an EPG superimposed into VBIs (vertical blanking intervals) of broadcast wave. The remote control interface 16 receives control signals from the remote control 3, and transmits them to the CPU 10. The CPU 10 controls the video-recording programming apparatus in Embodiment 1 and also performs various data conversions. Moreover, the CPU 10 is connected with the volatile memory 13 that allows data to be stored while power is supplied, and the nonvolatile memory 19 that allows data to be stored even while power is interrupted and reads stored data at the next start-up of the apparatus.

[0013]

Fig. 2 is a block diagram illustrating a software configuration running on the CPU 10 in Embodiment 1. As shown in Fig. 2, a CPU-10-executing software configuration includes an EPG unit 20, an encoder/decoder control unit 21, a system control unit 22, and a recording programming unit 28. The EPG unit 20 comprises an EPG control 24, an EPG data analysis unit 25, an EPG data backup unit 26, and an EPG database 27.

[0014]

The encoder/decoder control unit 21 controls the MPEG encoder 7 and the MPEG decoder 14. The system control unit 22 performs the status control of the video-recording programming apparatus based on input operations from control buttons (not shown) provided on the apparatus main unit, input operation from the remote control

interface 16, and on a status of the video-recording programming apparatus. The display system control unit 23 displays status, etc. on a display unit (not shown) provided on the apparatus main unit and on an exterior monitor via the OSD 18, in response to the status
5 of the video-recording programming apparatus. The recording programming unit 28 first performs processing of video-programming that a user has set, next checks whether there has occurred duplication between information that has already programming when new programming is made and information that is newly
10 programming, and then stores the programming contents into the nonvolatile memory 19. In the EPG unit 20, the EPG control unit 24 takes control of the EPG data analysis 25, the EPG data backup unit 26, and the EPG database 27, in response to EPG status such as EPG acquisition and EPG data display. The EPG data analysis unit
15 25 analyzes the EPG data extracted by the slicer 9.

[0015]

Specifically, since the EPG data is transmitted, as packetized, into the VBI, the analysis unit performs packet-analysis for dividing the EPG data into units of packets and categorizing on a kinds of
20 packets basis, decryption for decrypting the EPG data that is conveyed as encrypted, and decompression for decompressing the EPG data that has been compressed so as to reduce the volume of transmission data. The EPG data backup unit 26 performs backup processing for saving the EPG data onto the HDD 12 so as to display
25 a broadcast program guide listing without reacquisition of the EPG

data when the video-recording programming apparatus is powered off and then powered on again, as well as writing onto the volatile memory 13 data analyzed by the EPG data analysis unit. The EPG database 27 provides the recording programming unit 28 as being a
5 superordinate module utilizing the EPG, the system control unit 22, and the display system control unit 23 with various APIs (application programming interfaces) for referring to and utilizing the EPG data, as well as organizing a variety of information items (for example, start time, end time, broadcast time period, channel, title, detailed
10 information, program genre) being included in the EPG data after having been analyzed by the EPG data analysis unit 25.

[0016]

Next, the operation of the video-recording programming apparatus 1 will be described. First, a case in which the video-
15 recording programming apparatus 1 performs recording of a broadcast program will be described. It is assumed that programming data relating to a broadcast program planned to be recorded has already been set, and stored into the nonvolatile memory 19. While an video-recording programming apparatus 1
20 being in standby, typically, when the recording start time (e.g., three minutes prior to the recording start time) of a programmed broadcast program approaches, the system control unit 22 starts, which is set as timer-start-up in advance. Then the system control unit 22 provides a start-up instruction to each of modules (all of the modules
25 include the encoder/decoder control unit 21, the recording

programming unit 28, and the display system control unit 23 etc), and each of constituent elements (all of the element inside the video-recording programming apparatus 1, including the MPEG encoder 7, the MPEG decoder 14, and the HDD 12 etc), and moreover to provide
5 an instruction to the encoder/decoder control unit 21 so as to put the MPEG encoder 7 into standby mode to wait for recording. When the recording start time arrives, the broadcast waves received by the antenna 2 are tuned to the channel corresponding to the programmed broadcast program by the TV tuner 5, and its video and audio
10 information will be captured. Furthermore, the A/D converter 6 converts analog video signals into, e.g., digital signals conforming to Code Rec656, etc. The MPEG encoder 7 compresses in the MPEG format the digital video signals. Bitstreams outputted from the MPEG encoder 7 are temporarily stored into the recording buffer 8,
15 and written in the order of being stored, onto the HDD 12 controlled by a HDD controller 11.

[0017]

Next, the playback operation of the video-recording programming apparatus 1 will be described. A user manipulates the
20 remote control 3 (or a control panel, not shown, on the apparatus main unit) to display on, e.g., the monitor unit 4, a broadcast program table recorded in the HDD 12. The user selects by manipulating the remote control a reproduction-desired program from the broadcast program table displayed on the display monitor 4,
25 and gives instructions to reproduce the program. These processings

are executed by receiving radio or infrared signals transmitted from the remote control 3 at the remote control interface 16 and then sending the instructions to the CPU 10. The CPU 10 reads the playback-requested program via the HDD controller 11, storing the
5 bitstreams into the readout buffer memory 15. The MPEG decoder 14 reads the bitstreams having been stored into the readout buffer 15, and then performs MPEG-decoding. Decoded digital video signals are combined with other text display data signals, etc., and further, the combined digital video signals are converted by the D/A
10 converter 17 into analog signals, which are outputted onto the exterior display monitor 4, presenting the user with video images.

[0018]

Next, a method of acquiring EPG information by using the video-recording programming apparatus 1 will be described. Here, a
15 case will be described in which the EPG data is sent as superimposed onto the VBIs of broadcast waves in a particular channel. The video-recording programming apparatus 1 equipped with only one TV tuner may in some cases be incapable of receiving EPG-superimposed channels because the TV tuner is in use while broadcast programs
20 are being recorded or viewed. Consequently, the EPG information is assumed to be received only when the video-recording programming apparatus is apparently powered off, e.g., when in the standby mode.

Note that when an extra TV tuner is provided for exclusively receiving the EPG information, or a method is adopted such that a
25 plurality of TV tuners is switched over from one tuner to another on

a timely basis, the EPG data can be received even in a state in which the video-recording programming apparatus is powered on or in operation.

[0019]

5 Since, in Embodiment 1, only one tuner as the TV tuner 5 is mounted, the apparatus is assumed to receive, being in standby, signals. It is assumed that the video-recording programming apparatus has been in the standby mode and now the time when the EPG information is broadcast arrives. EPG-superimposed waves
10 are received by the antenna 2 and tuned in to EPG-superimposed channels by the TV tuner 5, and the slicer 9 extracts EPG data superimposed onto VBIs of video signals. The EPG data in Embodiment 1 is supposed to be that the data is transmitted being divided into minute packets, and also each packet is attached with a
15 packet ID for identifying what data the packet contains. In addition, information contained in the packets can be encrypted as required, so as to be incapable of being browsed or falsified easily. Moreover, each packet is compressed to reduce the data volume thereof. With respect to the EPG data that has been processed as
20 described above, the EPG data analysis unit 20 performs on a timely basis a packet-analysis for classifying packet data on a kind of packets basis, decryption for decrypting the encrypted EPG data, and decompression for decompressing the EPG data that has been compressed, and returning to the original EPG data before
25 compression. The processing of the EPG data as described above is

performed by the EPG data analysis unit 20, being stored into the volatile memory 13.

[0020]

5 The EPG data stored in the volatile memory 13 is wiped out when the video-recording programming apparatus 1 is powered off, resulting in the volatile-memory-13-stored EPG data being unavailable at the time of next start-up. Therefore, the same EPG data stored in the volatile memory13 is stored as a backup into the
10 HDD 12 or the nonvolatile memory 19. The data backup is performed after the EPG data acquisition, and the data analysis have been completed. On the other hand, restoration is performed in which the backed-up EPG data is written into the volatile memory 13 at the next power-on. It is the EPG data backup unit 26 that
15 backs up and restores the EPG data. When backing up the EPG data in the HDD 12 or the nonvolatile memory 19, the EPG data backup unit 26 compresses and encrypts the data so as to reduce the EPG data volume, and increase confidentiality protection for the data. Furthermore, as processing in which the EPG data is
20 returned from the HDD 12 and the nonvolatile memory 19, to the volatile memory 13, the EPG data backup unit 26 performs decompression of the compressed EPG data, and decryption of the encrypted EPG data. The EPG data stored in the volatile memory 13 is converted by the EPG database 27, into a data format that is
25 easier to use. In addition, the EPG database 27 provides by means

of the API the contents of the converted EPG data, to the recording programming unit 28, the system control unit 22, and the display system control 23, being superordinate modules. This API includes a database construction API. And by called this construction API the
5 EPG database 27 loads the EPG data into the volatile memory 13.

[0021]

Next, displaying onto the screen the EPG data will be described. When a user desires to display a program guide listing utilizing EPG-data, the user presses EPG display buttons provided
10 on the remote control 3. Then, the remote control 3 sends to the remote control interface 16 signals for displaying the program guide listing, and further, the interface 16 sends to the CPU 10 a command for EPG displaying. In the CPU 10, the system control unit 22 interprets the command from the remote control 3 and the remote
15 control interface 16, calls a database construction API prepared by the EPG database 27, and builds the EPG database. As a matter of course, when the EPG database has already been created, the construction API need not be called. By making use of the EPG database 27 created in this way, the display system control unit 23
20 collects the program information corresponding to designated dates, times and channels, creates a screen image on the OSD 18, and displays it on the display monitor 4. A display screen example of the electronic program guide table utilized EPG information is shown in Fig. 3. In this display example, broadcast times are indicated
25 vertically in the electronic program guide listing, and program

channels laterally. Each program is disposed so as to occupy an area corresponding to channel and time zone to be broadcast. Programs outside the display area can be displayed inside the display area by manipulating the up/down/right/left key on the remote control.

[0022]

Next, a method of programming a desired program from an electronic program guide listing displayed on the screen will be described. In Fig. 3, a user can select a desired recoding programming broadcast program by manipulating the remote control up/down/right/left key. When a desired program has been selected by the remote control 3, pressing the decision key makes the screen jump to a programming broadcast program listing screen (refer to Fig. 4), and then the selected program be additionally displayed in an empty space of the programming broadcast program listing screen. The programming broadcast program listing screen displays in a tabular form, programming recording programs; programming broadcast programs are indicated as a table, thereby giving an advantage of being easy to check. Moreover, setting information on a programming broadcast program, e.g., the recording start time, and the end time thereof can be changed on the programming broadcast program listing screen. That is, by selecting the programming broadcast program by the remote control 3, and pressing the decision key, the screen can enter a mode enabling modification of setting values relevant to the programming broadcast program. Along with

the fact that the programmed broadcast program information having been added onto the programming broadcast program listing screen is stored into the nonvolatile memory 19, the start timer of the system control unit 22 is set to the start time so that the video-recording programming apparatus starts up a few minutes, e.g., three minutes before the recording start time of a program having the earliest recording start time among the programmed broadcast programs. This allows the video-recording programming apparatus to be automatically powered on to start recording, even though it has been turned off. The operation of the recording is as has been described previously.

[0023]

Next, before describing a method of recording a broadcast program to be extended, a setting method of extending a broadcast program recording will be described. As one of the setting items on the basic setting screen (refer to Fig. 5) of the video-recording programming apparatus 1, a setting item about the extension recording function that is a function to change, by detecting programs to be extended or delayed, the recording end time, i.e., in Fig. 5, an item of "extension recording" is provided. From this item, whether or not the extension recording is performed, as well as how long the recording needs to be extended when the extension recording is performed (i.e., the extension time period per extension-keyword-detected program), can be set. When "No" is selected in the extension recording items, the extension recording will not be

performed. In the extension recording items, when broadcast programs are detected in which their broadcasting is likely to be extended or delayed while "Occur (30 minutes)" is selected, the video-recoding is performed with the recording end time delayed by 30
5 minutes every detected program. When programs are detected in which the broadcasting is likely to be extended or delayed while "Occur (60 minutes)" is selected, the video-recoding is performed with the recording end time delayed by 60 minutes every detected program. In Embodiment 1, although time period to be extended is
10 made selectable among the preset times, the time period may be made selectable as a time to be extended. In this way, when extension time period is made selectable, the extension time period can be selected in response to user's preference (when a user desires to avoid needless recording, a shorter time period is selected, and
15 when the user desires to avoid failure of recording, a longer time period is selected).

[0024]

Next, a recording method of recognizing that the broadcast time of a programmed broadcast program is extended or delayed, so that
20 the recording end time is changed, will be described. The method of programming the broadcast programs is the same as that of programming a desired program from an electronic program guide listing (refer to Fig. 3) as has been described previously. The difference in that the likelihood of broadcasting extension is
25 determined during a period after a broadcast program to be

programmed has been selected until the programming broadcast program table is displayed, and the recording end time of the programmed broadcast program is changed accordingly when broadcasting the program is extended or delayed. The method of recording by changing its end time will be described by using the flowchart shown in Fig. 6. When the programming of program is executed (step S101), the recording programming unit 28 having a function of reserving programs sets to zero (step S102) which is the number of the extension programs, and checks (step S103) whether or not EPG information having program guide information is present. When there is no EPG data available, the processing is completed (step S112). In the case where the EPG data is available, the programming unit 28 searches programs that are scheduled to be broadcast on the same channel and the same date as and prior to the programmed broadcast program (step S104), and, when a target program is found, acquires the program-related broadcast information (step S105). With respect to character information in the acquired information, EPG programs' detailed information such as program titles, program contents, and performers, the programming unit 28 searches extension keywords indicating that one or a plurality of preset programs be extended or delayed (step 106). As a result of the extension keyword search, if predetermined extension keywords are found (i.e., if a consecutive predetermined extension phrase, or a combination of two or more non-consecutive predetermined phrases, is detected), the program is regarded as a

program likely to be extended (step 107), thus resulting in the number of extension programs likely to be extended (the number of the extension programs) being increased by one (step S108). As stated above, when finishing the extension keyword search of one
5 program, the presence/absence of the next program is searched (step 104), and subsequently the foregoing extension keywords are searched. The keyword search from step S104 through step S108 is executed repeatedly until the search of all the corresponding programs is completed. Upon completion of searching all of the
10 corresponding programs, the processing exits from the loop. If the number of extension programs is found (step S109), the programming unit 28 calculates the total extension time period obtained by multiplying the preset extension time period by the number of extension programs (step 110), delays the recording end time by only
15 the total extension time period calculated, and writes into the nonvolatile memory 19 the modified recording end time (step S111). The subsequent operation is the same as that described in the method of reserving a desired program by means of the foregoing electronic program guide information.

20 [0025]

Next, a method of detecting a program extension will be demonstrated by giving an example of a specific detection extension keyword. The assumption is made that a talk show scheduled to be broadcast at 21:00, February 1 (Sunday) as shown in Fig. 3 is
25 recorded. This talk show broadcasting is assumed to start at 21:00

and end at 22:00. In the case of recording this program as usual, a recording start time is set to 21:00, and an end time thereof to 22:00.

Here, the extension recording function is assumed to be effectively set up, and the extension time period to be set to 30 minutes. In addition, as extension keywords for searching the program extension, e.g., "Extension" and "Until the end of the game" are assumed to be set. On the other hand, the assumption is made that search targets are detailed information including description of program titles, program contents, performers, etc., as EPG text data.

10 [0026]

Here, when a talk show is selected by a user on the remote control 3, an algorithm as shown in Fig. 6 described above operates, selects programs to be broadcast prior to the talk show, and executes a search for extension keywords of the program information. During this processing, a search of a professional baseball game to be broadcast at 19:00 is executed as well for the above-discussed extension keyword. According to program information obtained from the EPG, this professional baseball game scheduled to be broadcast at 19 o'clock is entitled "Professional Baseball Game XXX vs. YYY," and provided with detailed program information of "Ballpark: ABCXYZ, Commentator: XXXXX, Announcer: YYYZZZ (to be broadcast until the end of the game)." When this title and its detailed information are searched for the foregoing extension keywords "Extension" or "Until the end of the game," determination is made that the keywords meet "To be broadcast until the end of the

game,” so that there is a program whose broadcasting is extended or delayed. Accordingly, the recording end time of 22:00 will be reset to 22:30, delayed by 30 minutes corresponding to this program extension.

5 [0027]

Furthermore, in the case of recording “Friday-drama”, as shown in Fig. 7, as well, detailed information about previously broadcasting “professional baseball game ZZZ vs. XXX”, including “YYY Ballpark, Commentator: XXZZXX, Announcer: YYZYY (Extension may occur.),
10 can be detected in a similar way, allowing the recording end time to be modified from 22:00 to 22:30.

[0028]

As discussed above, in the video-recording programming apparatus 1 in Embodiment 1 as configured above, the recording end
15 time of a programmed broadcast program can be changed by detecting an extension keyword indicating a program whose broadcasting is to be extended or delayed; in the result, an occurrence in which part or the whole of the programmed broadcast program fails to be recorded can be avoided.

20 [0029]

Additionally, since means that detects a program whose broadcasting is extended or delayed, detects those from character strings of the program information, particular formats and transmission means are unnecessary in order to detect that
25 broadcasting a program is extended or delayed.

[0030]

With reference to a time period to be extended from the program recording end time, since the extension time period is preset, it is unnecessary to detect any time period to be extended, or
5 recording end time to be modified. That is, because it is unnecessary to detect the extension time period, and the recording end time to be modified, but it is only necessary to detect the possibility of the program extension or delay, accuracy of detecting a broadcast program being extended or a program being delayed is
10 enhanced.

[0031]

Still furthermore, by detecting broadcast programs that are extended or delayed, and the number of the programs, so as to calculate a total extension time period by multiplying the number of
15 the programs by the preset extension time period, the recording end time can be delayed by only this calculated total extension time period, so that this can cope with cases as well in which broadcasting a plurality of programs are extended or delayed.

[0032]

20 It should be noted that in Embodiment 1, EPG-information-acquiring means indicates a case in which the EPG data is superimposed onto a broadcasting wave; however, the means is not limited to that superimposed onto the broadcasting carrier, but may be acquired by means of communication lines, storage media, etc.

25 [0033]

Note that, in Embodiment 1, a broadcast program detection method has utilized detailed information of the broadcast program described as character strings; however, the detection method is not limited to target character strings, but may target significant
5 information that is similar to the character strings.

[0034]

Note further that although in Embodiment 1, a range where broadcast programs likely to be extended or delayed are detected is limited to "the same day as that of a programmed broadcast
10 program," "the same day" as referred herein not only means calendar dates, but may in some cases means a day defined in the EPG (e.g., one day from 5:00 a.m. on one day to 5:00 a.m. on the following day) or a day defined by broadcasters.

[0035]

15 Embodiment 2

Fig. 8 shows a flowchart for detecting a broadcast program extension or delay so as to modify the recording end time of a programmed broadcast program, according to Embodiment 2 in order to implement the present invention. The configuration of a video-
20 recording programming apparatus in Embodiment 2 is the same as that in Embodiment 1. In Embodiment 2, regarding a method of detecting possibilities of extension or delay of a programmed broadcast program scheduled to be broadcast prior to the programmed broadcast program, by further adding, in addition to the
25 extension keyword search in Embodiment 1, positional relationships

of a plurality of detected extension keywords, and non-extension keyword detection as well as a genre search of search-targeted programs, accuracy of detecting a program that is probably extended or delayed is enhanced.

5 [0036]

Referring to Fig. 8, a method will be described in which a broadcasting time of a programmed broadcast program is recognized to be extended or delayed, thereby the recording end time is changed, and then recording is performed. The method of programming a broadcast program is the same as that of programming a desired program from an electronic program guide listing as described in Embodiment 1, and also that of Embodiment 1 in which whether the program is likely to be extended is determined during a period until a programming broadcast program table is displayed, and a recording end time is changed when the program is determined to be extended.

In Embodiment 2, however, in addition to program titles and the program detailed information of the EPG, the possibility of extension of the program is searched by using the genre to which the program belongs as well.

20 [0037]

In the recording programming unit 28 having a programming function of broadcast programs, when programming a broadcast program is executed (step S201), the number of extension programs is reset to initial value "0" at first (step S202). Furthermore, checking-out is made whether or not EPG information having

program information is present (step S203). In cases where there is no EPG data available, the process ends (step S218). In the case of the EPG data being available, the program is searched for that is scheduled to be broadcast on the same day and the same channel as
5 and prior to the programmed broadcast program (step S204). If the targeted program is present, program information relating to the program is acquired (step S205). A search of character information in the acquired program data, e.g., detailed broadcast program information in which program titles, program contents, performers,
10 etc. are described, is performed for extension keywords indicating that one or a plurality of preset broadcast programs is not extended (step S206). As a result of the extension keyword search, when even one of the extension keywords is found (step S207), the corresponding program is regarded as being non-extension one, whereby searching
15 the next program ensues (step S204). On the other hand, in the event that even one of the extension keywords has not been found, the following process, that is, a genre search ensues (step S208). In the genre search (step S208), a genre to which a broadcast program targeted to be searched belongs is checked. If the genre to which
20 the search-targeted program belongs is determined to be a genre possibly to be extended or delayed (step S209), the next extension keyword search ensues (step S210). If it is determined not, the next program search ensues (step S204).

[0038]

25 The extension keyword search (step S210) searches character

information in the same program data as in Embodiment 1, e.g., detailed program information in which program titles, program contents, performers, etc. are described, for extension keywords indicating that one or a plurality of preset programs is extended
5 (step S210). As a result of the extension keyword search, when only one extension keyword is found, and a plurality of extension keywords is found if their combination criterion is satisfied (step S211), then the position of the one or the positions of the plurality of detected extension keywords will be acquired (step S212). When no
10 extension keywords are found, the processing moves to the next program search (step S204). Whether or not broadcasting the program is extended or delayed is determined from either the one or the plurality of detected extension keywords and their positional relationship (step S213). When the extension keywords and their
15 positional relationships are determined to be of broadcast programs that are extended or delayed, the number of the programs to be extended is increased by one (step S214). When the extension keywords and their positional relationship are determined not likely to be extended or delayed, the process moves to the next program
20 search (step S204).

[0039]

The processing repeats from step S204 through step 214 until the search of all the search-targeted programs is completed, and the process exits from the loop when no search-targeted programs are
25 found to be present. Next, if the number of the extension program is

equal to or smaller than zero, the process ends (step S218). If the number is greater than zero (step S215), a total extension time period is calculated (step S216) by multiplying the number of extension programs by the preset extension time period. Next, the recording end time is delayed from the recording end time that has been set by the calculated total extension time period depending on the calculated total extension time period. The above-described processing allows modifications of the recording end time.

[0040]

Next, a method of detecting a program extension will be demonstrated by giving examples of specific detection extension keywords. First, the detection extension keywords are relevant to the following (1) and (2),

(1) "Extension" + "Occur" (the character of "Occur" should appear within the predetermined number of characters in the rear space of "Extension" (here, within 10 characters)

(2) "Delay" (regardless of positional relationship) non-extension keyword corresponds to the following (3),

(3) "No extension"

As a genre (support genre) likely to be extended,

(4) Cases of "Sports" being set will be described.

[0041]

On the other hand, a program to be recorded is "Music XXX, Channel 8, recording start time 22:00, recording end time 23:00," search-targeted programs scheduled to be broadcast on the same

channel and the same day as and prior to the program to be recorded are the following programs 1 through 5.

Program 1: Title "Professional Baseball Game"

5 Detailed information "G vs. D (Maximum
extension until 21:24, subsequently broadcast programs
to be delayed accordingly),"

Broadcast start time 19:00, Broadcast end time
21:00

Genre "Sports"

10 Program 2: Title "Golf Tour Tournament"

Detailed information "Extension may occur"

Broadcast start time 14:00, Broadcast end time
16:00

Genre "Sports"

15 Program 3: Title "Sports of Memories"

Detailed information "Extension 17 innings
YokoXX vs. PYgakuen, at the end of the battle"

Broadcast start time 16:00, Broadcast end time 17:00

Genre "Sports"

20 Program 4: Title "Professional Baseball Game"

Detailed information "Yo vs. Ya (No extension, No
delay)"

Broadcast start time 12:00, Broadcast end time 14:00

Genre "Sports"

25 Program 5: Title "Weekly (XX day) Drama"

Detailed information "A String of Kyoto ZZZ Murders,

Screenplay by TANAKA XXichi,

Directed by ITSUKI YYhiro"

Broadcast start time 21:00, Broadcast end time 22:00

5 Genre "Dramas"

Following the above-described Program 1 through Program 5 in that order, the flowchart as shown in Fig. 8 is executed.

[0042]

Description will be started with step S204 for searching the
10 programs. In step S204, Program 1 is selected; in step S205,
program titles, detailed information, and genres are read. Because
non-extension keyword is not detected (step S207), the program is
relevant to a support genre (step S209); by the extension keyword
search (step S210), the extension keyword of "Delay" can be found in
15 the detailed information (step S211); and its positional relationship
does not matter (step S213), the number of extension programs is set
to "1." Next, the process returns to step S204 to select Program 2,
so that information on Program 2 is acquired (step S205). Any non-
extension keyword cannot be detected in this program either (step
20 S207); the program is relevant to a support genre (step S209); by the
extension keyword search (step S210) "Extension" and "Occur" are
found (step S211); and the positional relationship between character
strings "Extension" and "Occur" satisfies a preset condition (step
S213), the number of extension programs is set to "2" by further
25 increasing by one. Next, the process returns again to step S204 to

select Program 3, and thereby the information on the program 3 is acquired (step S205). Since any non-extension keyword cannot be detected in this program either (step S207); the program is relevant to a support genre (step S209); by the extension keyword search (step S210) "Extension" is found but not with "Occur" (step S211), which does not satisfy the positional relationship between character strings "Extension" and "Occur" (step S213); the number of extension programs will not be increased.

[0043]

10 Next, the process returns to step S204 to select Program 4, thereby the information on Program 4 is acquired (step S205). This program includes in the detailed information the extension keyword "Delay"; however, since non-extension keyword "No extension" is inclusive, the process returns from step 207 to step 204. Next, the
15 process returned to step S204 to select Program 5, so that the information on Program 5 is acquired (step S205). Since this program's genre is categorized into "Drama," which is not a support genre (step S209), the process returns to step S204. Since, with the above described processes, the search of all programs has been
20 completed, the process moves to step 215. Since the number of extension programs is two, the total extension time period is determined to be 60 minutes, i.e., multiplication of 30 (minutes per program) by 2 (programs) equals 60 (minutes) (step S215 and step S216), delaying the recording end time from 23:00 to 24:00. This
25 reduces, even though each program is extended, occurrences in which

part or the whole of the programmed broadcast program fails to be recorded.

[0044]

Since, as discussed above, in the video-recording programming apparatus configured as in Embodiment 2, in contrast to cases in which the extension keywords having possibilities of extension or delay as in Embodiment 1 are detected, and thereby a recording end time is delayed by a preset extension time period, broadcast programs subject to no extension nor delay are detected by using non-extension keywords, confusing characters, even though found in titles or detailed information, will not be wrongly recognized.

[0045]

Furthermore, by limiting genres where extensions are to be made, programs that belong to genres not likely to be extended have no possibility of wrong determination due to the extension keyword search, further requiring no time to perform the extension keyword search.

[0046]

In addition to the extension keyword search, since the combination of a plurality of extension keywords and detected positions of one or a plurality of extension keywords are evaluated, wrong determination of a non-extension program as being an extension program can significantly be reduced in cases where only a character string of "Extension" as in Program 3 is included and also cases where although both characters strings of "Extension" and

"Occur" are included, they indicate entirely different meaning.

[0047]

Note that as an extension keyword, other phrase such as "extension until" may be used. Note again that it is preferable that
5 the number of characters in the extension keyword be made to be four characters or more, whereby the probability of occurrence of unnecessary extensions can effectively be reduced. Note further that extension keywords, non-extension keywords, and support genres may be configured so as to be capable of being selected or set
10 by a user's manipulation.

[0048]

Also, Embodiment 2 is the same as above-described Embodiment 1 except those described above.

15 [BRIEF DESCRIPTION OF DRAWINGS]

[0049]

Fig. 1 is a block diagram outlining a configuration of a video-recording programming apparatus according to Embodiment 1 of the present invention;

20 Fig. 2 is a block diagram illustrating a software configuration in Embodiment 1;

Fig. 3 is a diagram illustrating an electronic program guide listing screen in Embodiment 1;

Fig. 4 is a diagram illustrating a programming broadcast
25 program table screen in Embodiment 1;

Fig. 5 is a diagram illustrating a setting screen in Embodiment 1;

Fig. 6 is a flowchart illustrating a method of programming the recording of broadcast programs in Embodiment 1;

5 Fig. 7 is a diagram illustrating an electronic program guide listing screen in Embodiment 1; and

Fig. 8 is a flowchart illustrating a method of programming the recording of broadcast programs in Embodiment 2.

10 [DESCRIPTION OF NUMERALS AND SYMBOLS]

[0050]

- 1 video-recording programming apparatus
- 2 antenna
- 3 remote control
- 15 4 monitoring display
- 5 TV tuner
- 6 A/D converter
- 7 MPEG encoder
- 8 recording buffer
- 20 9 slicer
- 10 CPU
- 11 HDD controller
- 12 HDD
- 13 volatile memory
- 25 14 MPEG decoder

- 15 readout buffer
- 16 remote control interface
- 17 D/A converter
- 18 OSD
- 5 19 nonvolatile memory
- 20 EPG unit
- 21 encoder/decoder control unit
- 22 system control unit
- 23 display control unit
- 10 24 EPG control unit
- 25 EPG data analysis unit
- 26 EPG data backup unit
- 27 EPG database
- 28 recording programming unit

[Name of Document] ABSTRACT

[Abstract]

[Object]

To provide a video-recording programming apparatus and method
5 therefor which avoid the situation where a programmed broadcast
program is not partially or wholly recorded, by detecting the
possibility of extensions of the programmed broadcast program and a
broadcast program to be broadcast before the programmed broadcast
program, and delaying the recording end time of the programmed
10 broadcast program when the program extension is determined.

[Means for Solution]

A video-recording programming apparatus and method therefor, for
programming recording by setting the recording start time and the
recording end time of a given program in the broadcast program
15 information is provided, wherein the video-recording programming
apparatus and method therefor delay the recording end time of
programmed broadcast program, when a broadcast program is
present in which an extension keyword is detected by searching
electronic program guide information acquired relating to broadcast
20 programs to be programmed, and electronic program guide
information acquired relating to programs scheduled to be broadcast
on the same channel and the same date as and prior to the
programmed broadcast program, for predetermined extension
keywords indicating program extension or delay.

25 [Representative Drawing] Fig. 6

Fig. 1

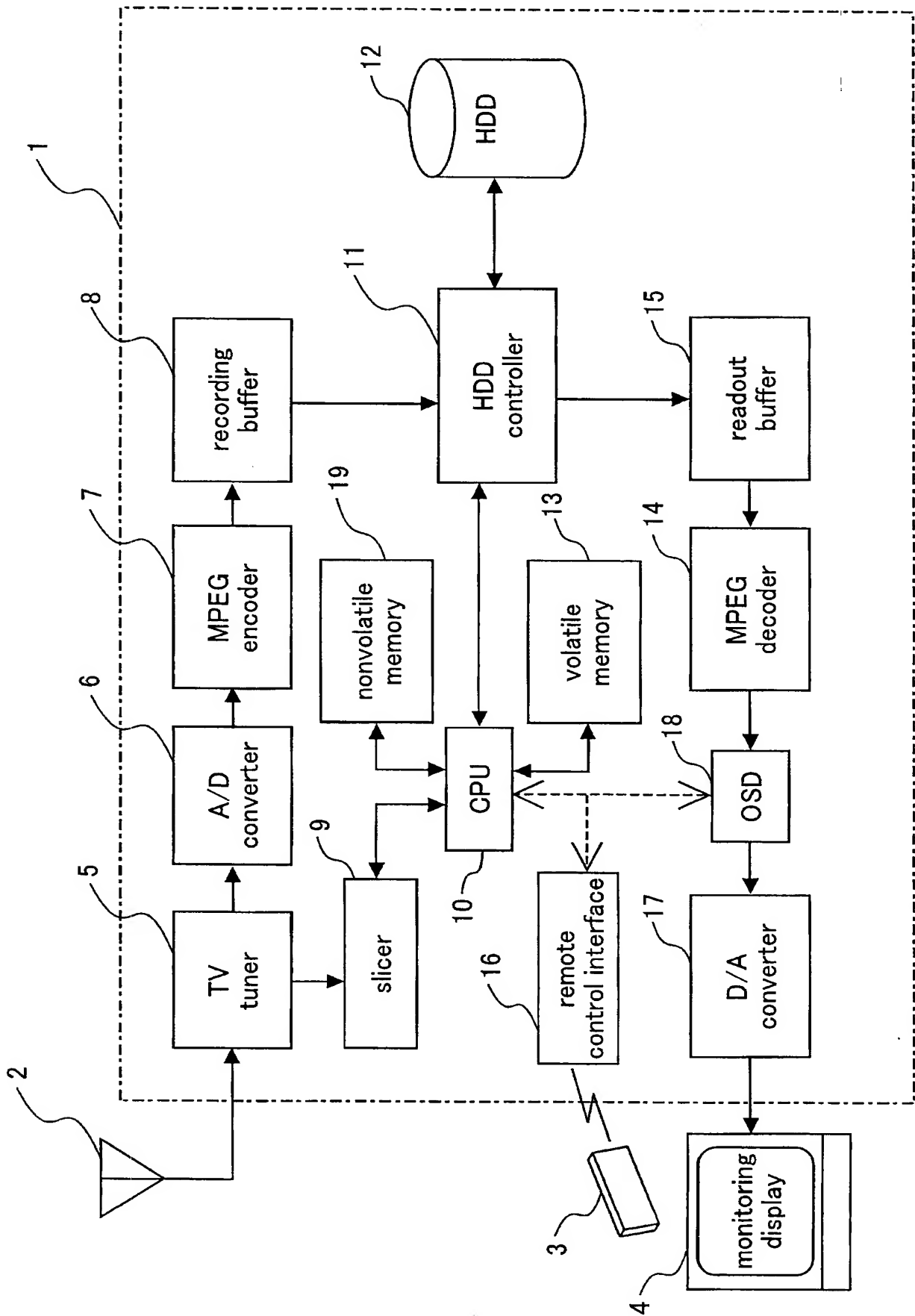


Fig.2

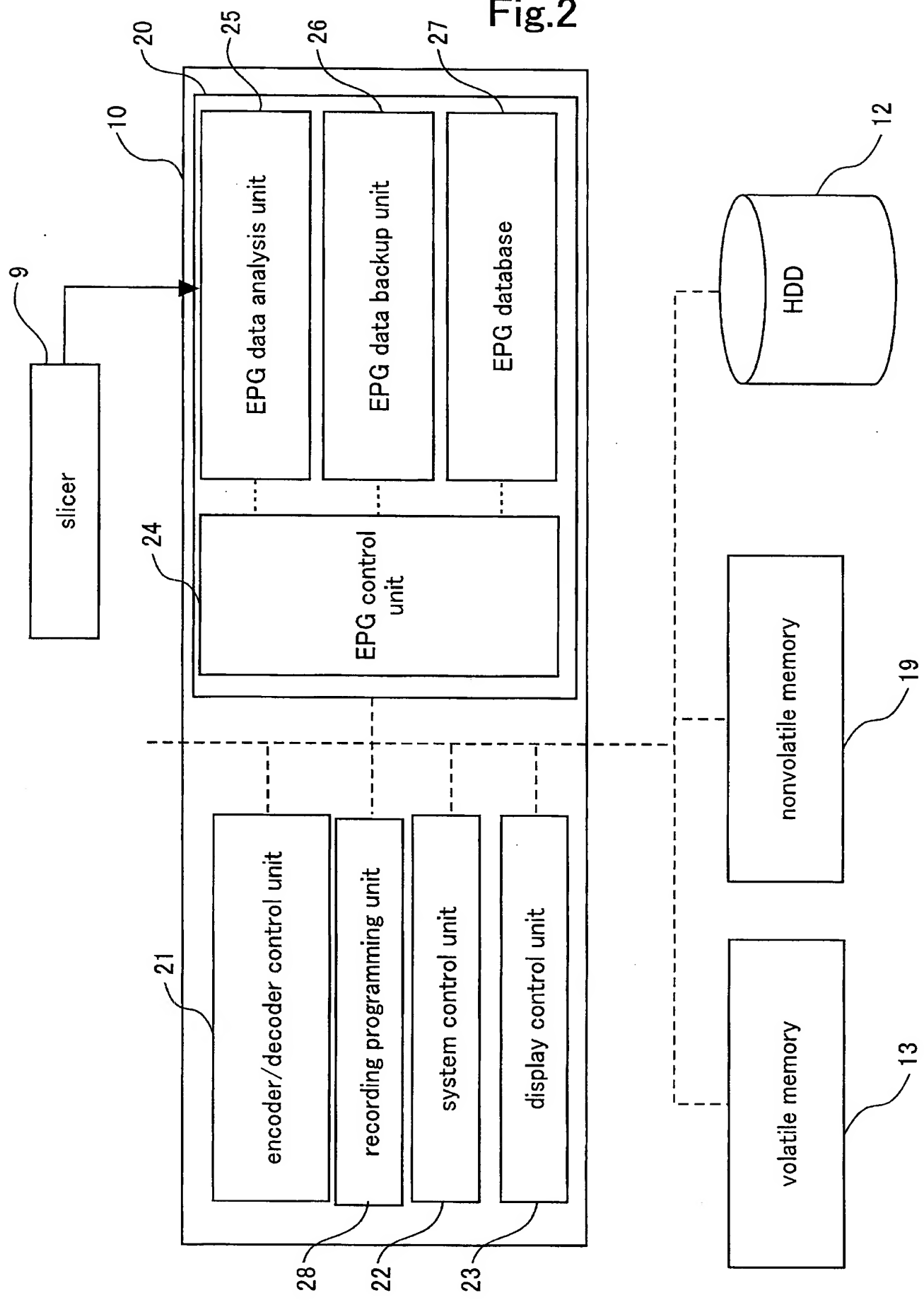


Fig.3

electronic program guide listing		current time: 2004 February 1(Sunday) 16:04	
February 1(Sunday)	Channel 8	Channel 10	channel 12
19	00 news	00 Professional baseball game XXX vs. YYY, ZZZ ballpark, Color commentator: XXXX, Play-by-play announc er: YYYYYY (to be broad cast until the end of the game)	00 animation
20	00 documentary		00 quiz
21	00 news coverage special program	00 talk show	00 variety

Fig.4

[illegible]

Fig.5

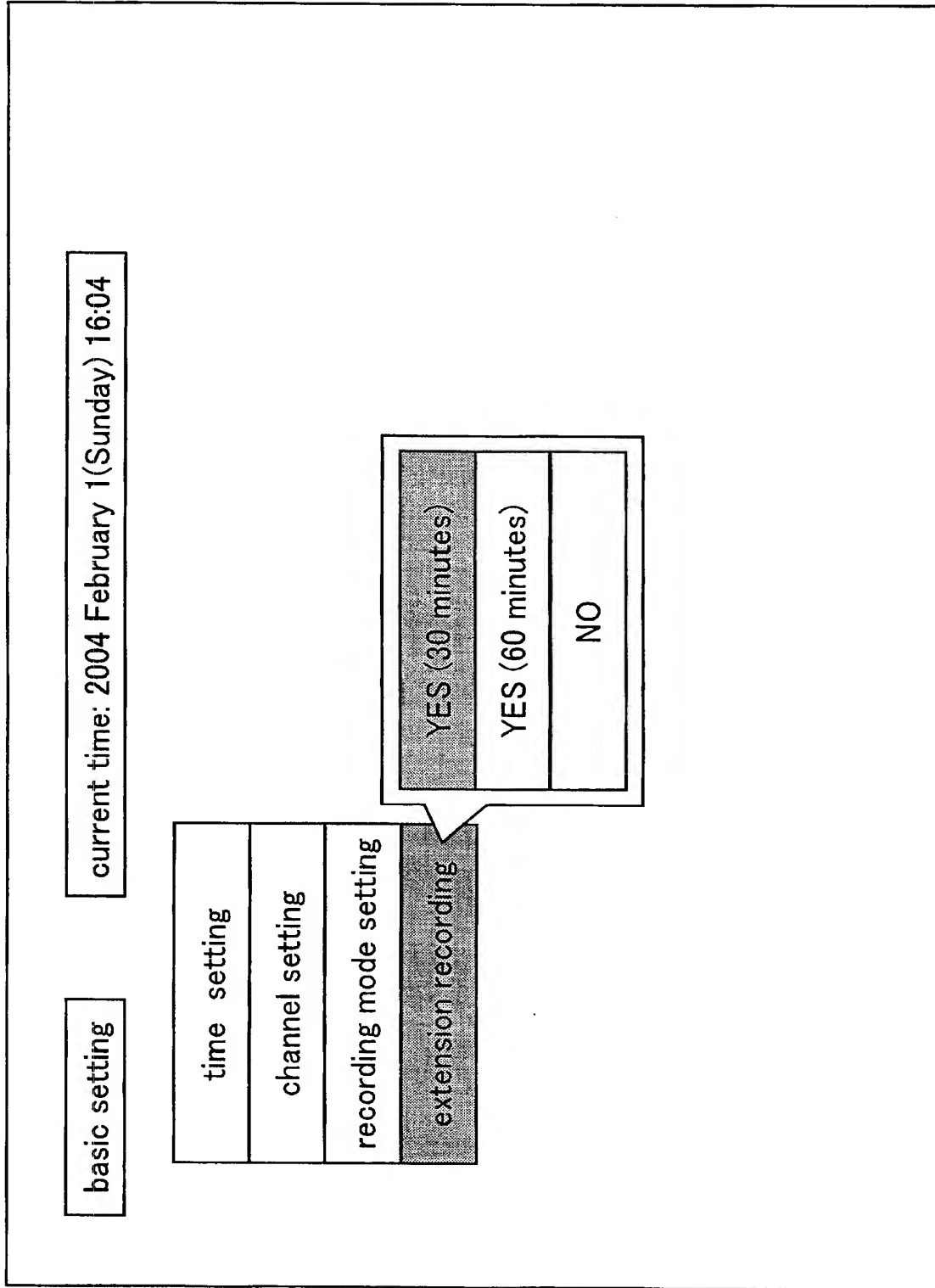


Fig.6

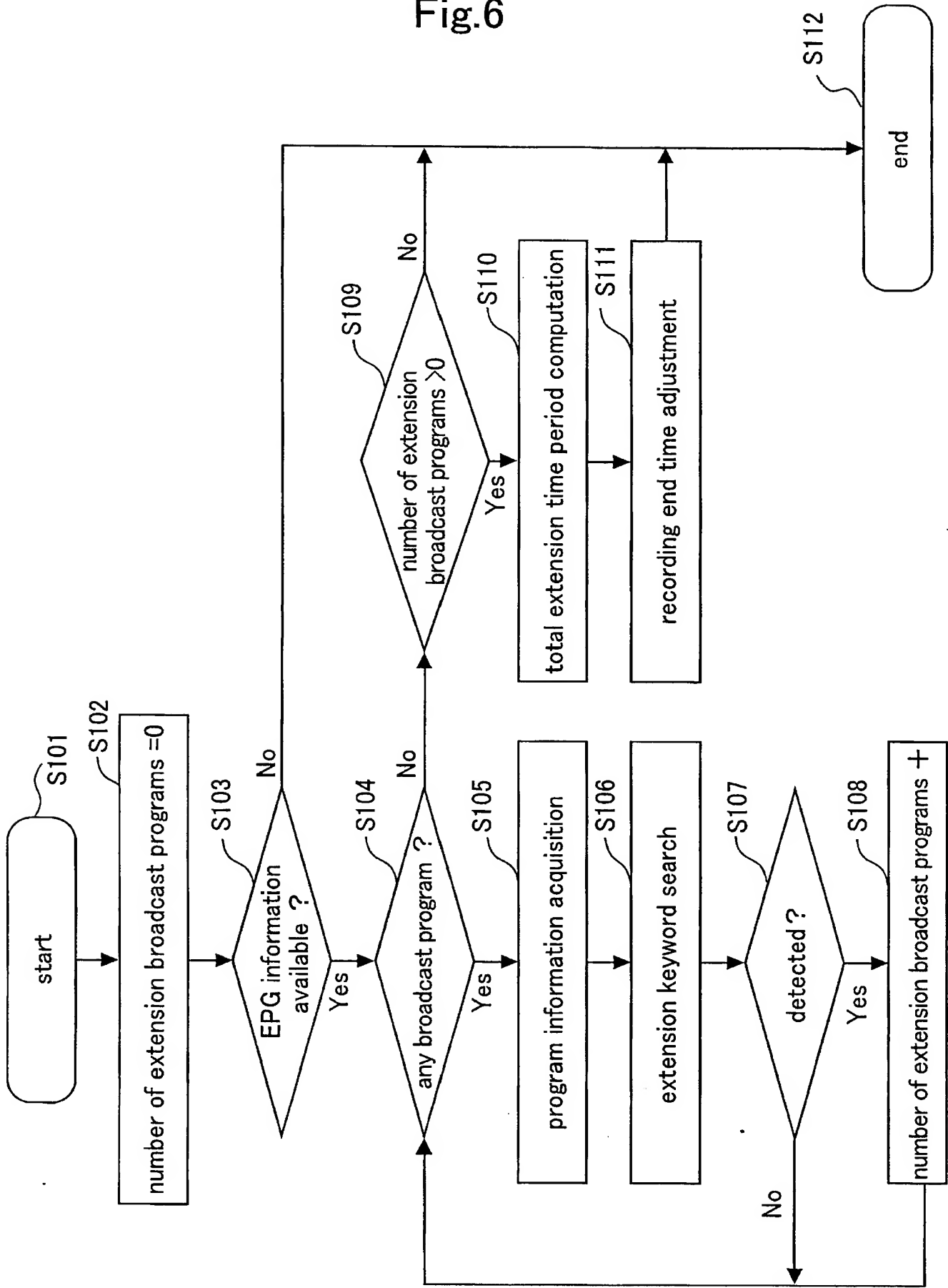


Fig.7



electronic program guide listing		the current time: 2004 April 2 (Friday) 18: 10		
April 2 (Friday)	Channel 8	Channel 10	channel 12	
19	00 news	00 Professional baseball game ZZZ vs. XXX, YYY ballpark, Color commentator: XXZXX, Play-by-play announcer: YYZYY (extension may be occurred)	00 animation	
20	00 documentary		00 variety	
21	00 business	00 Friday drama	00 music	

Fig.8

